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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,364	12/08/2004	Rengaswamy Srinivasan	1858-SPL	3973

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EXAMINER

HE, AMY

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/517,364	SRINIVASAN ET AL.	
	Examiner	Art Unit	
	Amy He	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 1-3 and 18-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 4-14 and 17 is/are rejected.
- 7) ☒ Claim(s) 15 and 16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/8/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim 1, drawn to an embeddable corrosion rate meter.

Group II, claims 2-3 and 18-22, drawn to a method/system for detecting and measuring corrosion.

Group III, claims 4-17, drawn to an embeddable corrosion rate system.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I lacks unity with Groups II and III because Group I does not require the working electrode being evenly separated from a counter electrode, wherein a separation distance between the working electrode and the counter electrode determines an electrolyte medium resistance, the electrolyte medium resistance is less than or equal to a polarization resistance; a first selector; and a voltmeter/A-D converter as in Groups II and III, and because Groups II and III do not require the ECRM to be encapsulated in an aggregate-size, inert container, not bigger than 2cm in diameter and about 1 cm in height as in

Group I. Group II lacks unity with Group III because Group III does not require the voltmeter to have an input impedance greater than a billion ohms as in Group II.

2. During a telephone conversation with Mr. Albert J. Fasulo on June 15, 2006, a provisional election was made without traverse to prosecute the invention of Group III claims 4-17. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-3 and 18-22 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

4. Claims 5 and 11 are objected to because of the following informalities:

(1) Claim 5, lines 1-2, the word "about" renders the claim unclear as to which specific values of the diameter and height is claimed.

(2) Claim 11, line 1, it seems that the claim should be dependent upon claim 10 instead of 4 as claimed. Otherwise, "the non-corroding inert material" lacks antecedent basis.

(3) Claim 12, line 3, it is unclear whether the "/" as in "a voltmeter/A-D converter" means "AND" or "OR". For the purpose of examination, it is best understood as "a voltmeter or A-D converter".

Appropriate corrections are required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-9, 12-14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly et al. (U. S. Patent No. 6, 690, 182), in view of Tejfalussy et al. (U. S. Patent No. 4, 155, 814).

As for claim 4, Kelly et al. discloses an embeddable system (embeddable corrosion measuring instrument 40 as shown in Figure 1 and 3-5) for detecting and measuring corrosion in a structure (rebar reinforced structures, col. 5, line 10) susceptible to corrosion, said system including a plurality of embeddable corrosion rate meters (ECRM 40) for collecting corrosion measurements data and at least one computing device (external data logger or computer/microcontroller 12, see abstract) for analyzing said corrosion measurements, said system comprising:

at least one working electrode (42) evenly separated from a counter electrode (44), wherein a separation distance between said at least one working electrode (42)

and said counter electrode (44) determines an electrolyte medium resistance, said electrolyte medium resistance is less than or equal to a polarization resistance(col. 3, lines 42-43);

a signal generator (potentiostat 50) for generating a current source;

an external reader-head (the combination of the external data logger or computer 102, the RF/wireless data connection 171 and the external power supply, see abstract; Figure 5) with a data link and a power link connected to said computing device for powering (using the external power supply) said ECRM and transferring (using the RF/wireless data connection 171)corrosion measurements data via said data link.

Kelly et al. does not specifically disclose: the current source is connected to a plurality of resistances for creating a plurality of current amplitudes; a first selector for applying current through each of said plurality of resistances to said at least one working electrode and said counter electrode, wherein said current is applied via a galvanostat.

Tejfalussy et al. discloses that either a potentiostat or a galvanostat can be used for measuring the rate of corrosion (col. 2 line 56-col. 3 line 7).

A person of ordinary skill in the art would find it obvious at the time the invention was made to modify Kelly et al. to use a galvanostat (or to use the potentiostat as a galvanostat) for measuring the rate of corrosion, since it is conventional in the art to use either a potentiostat or galvanostat for measuring the rate of corrosion, as evidenced in Tejfalussy et al. (col. 2 line 56-col. 3 line 7). When the potentiostat is used as a galvanostat, the person of ordinary skill in the art would find it obvious to modify the

potentiostat of Kelly et al. to use a first selector for selectively applying current through each of a plurality of resistances to the at least one working electrode and the counter electrode, for the purpose of applying different range of current to the working electrode and the counter electrode, and selectively providing the 10 cell current samples for calculate the polarization resistance (see Figure 9).

As for claim 5, Kelly et al. does not specifically disclose that the corrosion meter is between about 1 to about 5 centimeters in diameter and between about 0.2 to about 1 centimeter in height. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Kelly et al. to disclose that the corrosion meter is between about 1 to about 5 centimeters in diameter and between about 0.2 to about 1 centimeters in height, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 220 F. 2d 459, 105 USPQ 237 (CCPA 1955). And Kelly et al. teaches that the maximum dimension of the corrosion meter is less than 3.5" x 2.5"x 2.5" (col. 10, lines 17-18).

As for claim 6, Kelly et al. discloses that the counter electrode is separated from said at least one working electrode by holder material (potting material, col. 7, lines 29-44).

As for claim 7, Kelly et al. discloses that the working electrode is made from the same material as the structure being detected for corrosion (col. 5, lines 24-25).

As for claim 8, Kelly et al. discloses that the working electrode is made from a stainless steel (col. 6, lines 47-50).

As for claim 9, Kelly et al. discloses that the structure is a rebar (col. 5, line 10).

As for claim 12, Kelly et al. discloses an A-D converter (20) for measuring polarization of the working electrode. Kelly et al. does not explicitly disclose a second selector for selecting the duration of a current pulse. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to further modify Kelly et al. to disclose a second selector for selecting the duration of the current pulses for the 10 current samples, so as to acquire the 10 cell current samples over values other than the 3.33 seconds (see Figure 9), as desired by the different applications involved.

As for claim 13, Kelly et al. discloses that the corrosion measurements data is used for graphing a plot of I_j vs. $(V_p)_j$, with OCV as the origin and estimating a slope of the plot of I_j vs. $(V_p)_j$, wherein the slope provides the value of the polarization resistance, R_p , which is inversely proportional to the corrosion rate (see Figure 9).

As for claim 14, Kelly et al. discloses that the corrosion measurements data is obtained by disconnecting (disable cell) the galvanostat (50) from the working electrode (42) and the counter electrode (44) and measuring a voltage difference between the working and counter electrodes (see Figures 9 and 10).

As for claim 17, Kelly et al. discloses a unique electronic radio-frequency ID for identification of the ECRM (col. 8, lines 5-6 and lines 48-51).

6. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly et al. (U. S. Patent No. 6, 690, 182) in view of Tejfalussy et al. (U. S. Patent No. 4, 155, 814), and further in view of Jasinski (U. S. Patent No. 4, 863, 572).

As for claims 10 and 11, Kelly et al. does not specifically disclose that the counter electrode is made from a non-corroding inert material, such as graphite. Jasinski discloses a counter electrode made from a non-corroding inert material, such as graphite (col. 28, lines 25-32). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to further modify Kelly et al. to disclose a counter electrode made from a non-corroding inert material, such as graphite, as taught by Jasinski, for the purpose of eliminating the contamination of the corrosive environment with undesired reaction products (col. 28, lines 31-32).

Allowable Subject Matter

7. Claims 15-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

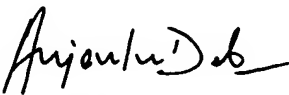
Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy He whose telephone number is (571) 272-2230. The examiner can normally be reached on 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AH
June 16, 2006.


ANJAN DEB
PRIMARY EXAMINER